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ABSTRACT

This report presents an investigation of the immigrant experience in New York City public schools. In particular, it presents a statistical portrait of the resources and characteristics of the public schools attended by immigrant students, their distribution across schools, and the relationship between resources and outcomes, on the one hand, and the representation and characteristics of immigrants on the other. The focus of the paper is on issues of equity and distribution. The paper begins with a brief review of existing research. It then presents the methodology and results of the study. Data for the study included tests scores and demographics of students, teacher characteristics, pupil-teacher ratios, and expenditure information. Following are some of the results: Immigrants are not more segregated than blacks, Hispanics, or poor students. The segregation of immigrants is lowest in elementary schools and highest in middle schools. (Some of this segregation is undoubtedly programmatic, such as enrollment in newcomer schools.) A significant portion of immigrants is black, many are white, and a significant portion is not limited in English proficiency. Not all immigrant groups are treated equally. (Contains 6 tables and 17 references.) (WFA)

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# Immigrants and Education: Evidence from New York City.

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# IMMIGRANTS AND EDUCATION: EVIDENCE FROM NEW YORK CITY

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New York City's public school system educates more immigrant students, from a broader range of countries (over 200), speaking a broader diversity of languages (over 120) than any other school system in the country. There has been relatively little research by economists, however, into the experience of the immigrant students, their treatment in the schools, or their impact on the schools they attend. This paper takes a step toward filling that gap, making use of school-level data to investigate the immigrant experience in the public schools. In particular, our empirical work paints a statistical portrait of the resources and characteristics of the public schools attended by immigrant students, their distribution across schools, and the relationship between resources and outcomes, on the one hand, and the representation and characteristics of immigrants on the other. Thus, the focus of this paper is on issues of equity and distribution. We leave concerns about efficiency and efficacy of programs to future work.

## A BRIEF REVIEW OF EXISTING RESEARCH

While most academic studies of immigrants and education have been ethnographic, there have been several important quantitative studies of immigrants and educational attainment, including Betts and Loftstrom (1998) and Vernez and Abrahamse (1996).[1] Two important findings emerge from this literature. First, immigrant children are at least as likely as native-born children to be enrolled in school, and, second, the educational attainment of immigrants is, in many respects, comparable to that of the native born. In addition, Betts and Lofstrom find some evidence that the success of the immigrants comes at the direct or indirect expense of the educational attainment of the native born. Put simply, immigrants might *crowd out* the native born in competition for educational resources or opportunities.

The research on educational resources and immigrants has focused on the costs associated with limited English proficiency (LEP). Duncombe and Yinger (1997) and Downes and Pogue (1994), for example, find that district costs increase with larger representation of LEP students. Although, as discussed below, additional resources may be available for schools and districts serving LEP students, they may be insufficient to cover the additional costs, implying a decrease in resources available for educational programs.[2]

Rivera-Batiz (1996) examines the impact of immigrants on schools per se, using New York City school-level data to examine the determinants of passing rates on reading and math exams.[3] He finds that the proportion of recent immigrants in a school has a positive impact on outcomes, while the proportion of LEP students has a negative impact. Our analysis builds on this research, using richer data, and investigates resources as well as performance.

## POLICY CONTEXT

As detailed in Gershberg (2000), the number and proportion of immigrant and LEP students in New York City have grown since the 1980s, contributing significantly to school overcrowding in some neighborhoods and creating a public perception that the school system has "an immigrant problem" that it is poorly equipped to handle.

Students in New York City are categorized as LEP eligible if the first language spoken in their home is not English and if they score below the 40th percentile on a test of English language skills. LEP eligible students must enroll in either free-standing English as a Second Language (ESL) or Bilingual Education. ESL programs provide one to two pullout classes per day of training, while

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subject courses are taught in English. Bilingual programs provide ESL training, but subject classes taught in the students' native languages. Bilingual programs may not be available at every school, as they must be provided only if 20 or more students in the same grade speak the same language.

Recent work by the New York City Board of Education (NYCBOE, 2000) found that the academic success of LEP students–measured, primarily, by their exit from ESL/Bilingual programs–depends critically on the grade at which they enter the city public schools.[4] Those entering in elementary school, especially kindergarten and first grade, do the best, followed by those entering in high school. The implication is that the immigrant experience and the needs of immigrants differ significantly between elementary, middle, and high school, and our empirical investigation should treat these separately.

Nearly all public policy aimed at immigrant students in New York City and State relates to teaching English and/or bilingual education. As an example, approximately $81 million in state aid was provided to fund ESL and bilingual education programs in 1996-97, while federal aid for assisting in the education of LEP students was approximately $23.5 million. In contrast, there is a small federal program, the Emergency Immigrant Education Program (EIEP), aimed at immigrants, per se. At approximately $5 million in funding in 1996-97, however, the EIEP is too small to have a great impact on educational resources (Gershberg, 2000).

New York City has little in the way of an articulated policy for educating immigrants. There are seven "newcomer" schools, which concentrate on teaching new immigrants. Interestingly, these have not arisen out of any organized city or state policy, but rather out of various grassroots efforts to create opportunities and appropriate educational programs for new immigrants.

## DATA AND MEASURES

This study uses school-level data from the New York City Board of Education's Annual School Reports (ASR) for 1996-1997 and 1997-1998, and School Based Expenditure Reports (SBER) for 1997-1998.[5] The ASRs provide information on test scores and demographics of students, as well as teacher characteristics. The SBERs contribute expenditure data, pupil-teacher ratio, and the percentage of students in part- and full-time special education. Variables capturing the interaction between socioeconomic and demographic characteristics were calculated based on a student-level data file provided by the NYCBOE's Division of Assessment and Accountability for elementary and middle schools.

The sample includes 1,097 schools and more than a million students.[6] The sample breakdown is 691 elementary schools, 233 middle schools, and 173 high schools.[7] (There are more than 1,100 public schools in the city, but several were excluded due to missing or incomplete data.)

School-level performance was captured by a test in reading proficiency (CTB) and in math proficiency (CAT). In 1997-1998, average Normal Curve Equivalents (NCE) were reported for each school. In 1996-1997, only the percentage of students performing above the 50$^{th}$ percentile (based on a national sample) was reported. In our elementary school analyses, we use data on test performance for the fifth grade for 1997-98 and the "lagged" value of fourth grade performance (performance on the fourth grade test in 1996-97 for the same school). Our middle school analyses use eighth grade tests for 1997-98 and the lagged value of seventh grade tests (performance on the seventh grade test in 1996-97 for the same school).[8] The absence of consistent performance data precludes a high school analysis.

Demographic data include the percentage of immigrants that arrived in the United States within the past three years (recent immigrants) and the percentages of students that are female, eligible for free lunch, limited English proficient (LEP), black, Hispanic, or Asian. Interaction variables include a breakdown of recent immigrants by race, limited English proficiency, and poverty; a breakdown of the "poor" population (free lunch eligible) by race; and a breakdown of the LEP population by race and poverty.[9] We use three resource measures–expenditure per pupil, pupil-teacher ratio and teacher education, and the percentage of teachers with a Master's degree.[10]

Notice that our data describe only the population of recent immigrants–not students who are not native born or the second generation children of immigrants. Thus, we also analyze the LEP population in an effort to capture the larger group. Unfortunately, this group misses the non-native born who are not LEP eligible–including, for example, Caribbean students–an important oversight.

## METHODOLOGY

We use two conventional measures of segregation and racial composition–dissimilarity indices and exposure indices. Dissimilarity indices measure the percentage of all immigrants (or other group) who would have to change schools in order for the group to be distributed evenly across schools. The dissimilarity index is calculated as

$$D = 100^{*} \sum \left[ \frac{x_i}{\Sigma x_i} - \frac{y_i}{\Sigma y_i} \right] / 2$$

where $x_i$ represents the number of immigrants in school $i$ and $y_i$ represents the number of non-immigrants in school $i$. $D$ ranges from a low of zero, when immigrants and non-immigrants are distributed identically, to a high of 100, when immigrants are completely segregated–that is, there are no schools that include both immigrants and non-immigrants. For comparison purposes, we also calculate dissimilarity indices for LEP students and other demographic groups.

Exposure indices measure the degree of contact between immigrants and students in other socioeconomic groups. The exposure of immigrants to students of type $Y$ is calculated as:

$$E_{XY} = \Sigma_i x_i (y_i/t_i) / \Sigma x_i = \Sigma_i [ (x_i / \Sigma_i x_i)(y_i/t_i) ]$$

where $t$ is the total number of students, $x$ represents the number of immigrants, $y$ is the number of students in the comparison group, and $i$ indexes schools.[11] Put differently, $E_{XY}$ measures the percentage of the students of type $Y$ in the school attended by the "average" immigrant student.

Enrollment-weighted means provide a portrait of the school attended by the "average student"–or the average student of some particular group, such as immigrant students. Enrollment-weighted means differ from unweighted means due to differences in the characteristics of schools that are correlated with enrollment. Weighted means will, in turn, differ from one another to the extent that the distribution of immigrant (LEP) students differs from the distribution of pupils overall. These statistics allow us to examine the extent to which the immigrant experience differs from that of the typical students.

Finally, we perform regression analyses of three resource measures and two performance measures described above. The resource regressions describe equity in the distribution of resources across schools, capturing the relationship between resources and the representation of immigrants, controlling for other characteristics of the school and students. The performance regressions describe equity in the distribution of outputs across schools, capturing the relationship between output and the representation of immigrants, ceteris paribus.[12] The regression coefficients can be interpreted as capturing the difference in the resource (or output) associated with an increase in the representation of immigrants, controlling for the socioeconomic characteristics of the student body. Note, however, two important caveats. First, our work does not provide guidance on what these coefficients *should* be–that rather difficult job is outside the scope of this paper. Second, these regressions are not specified to capture causal relationships. The resource equations cannot be interpreted as cost functions or factor demand equations–there are, after all, no prices among the independent variables–and no argument is made that these resource allocations have emerged from cost minimization efforts by schools or school districts. The output equations cannot be interpreted as production functions–there are, most importantly, no input variables among the dependent variables–and no claim is made that the regression equation captures the production of education.

## RESULTS

As shown in Table 1, New York City public schools include a significant proportion of immigrant students. Almost 8 percent of the students in the average school are recent immigrants; almost 16 percent are LEP. Some schools have virtually no immigrant (LEP) students and others are composed almost entirely of recent immigrants (LEP), with a broad range in between. Similar patterns emerge for other socioeconomic groups. The average school is more than a third black, more than a third Hispanic, roughly 10 percent Asian and 16 percent white, and more than two-thirds poor. The pupil-weighted means are substantively the same.[13]

The exposure indices in Table 1 indicate that the typical immigrant is exposed to a different demographic mix of students than the typical New York City public school student. The classmates of the typical immigrant are less likely to be black, more likely to be Asian and LEP. Further, almost 15 percent of their classmates are recent immigrants themselves.

*Table 1*
**Descriptive Statistics and Exposure Indices for Demographic Variables**

| *Label* | *N* | *Mean, Unweighted* | *Enrollment Weighted Mean* | *Immigrant Weighted Mean* | *LEP Weighted Mean** | *Minimum* | *Maximum* |
|---|---|---|---|---|---|---|---|
| | | | *All Schools* | | | | |
| Percent Female | 1,097 | 49.2 | 49.0 | 48.8 | 48.8 | 6.0 | 100.0 |
| Percent Black | 1,097 | 36.6 | 35.3 | 28.8 | 23.9 | 0.0 | 97.6 |
| Percent Hispanic | 1,097 | 37.7 | 37.3 | 39.2 | 51.1 | 1.3 | 99.4 |
| Percent Asian | 1,097 | 9.9 | 11.5 | 16.6 | 13.3 | 0.0 | 94.3 |
| Percent White | 1,097 | 15.8 | 15.9 | 15.4 | 11.7 | 0.0 | 93.8 |
| Percent Free Lunch | 1,097 | 71.3 | 66.3 | 67.6 | 74.0 | 5.9 | 100.0 |
| Percent Recent Immigrants | 1,097 | 7.8 | 9.0 | 14.6 | 12.4 | 0.0 | 96.3 |
| Percent Limited English Proficiency | 1,047 | 15.7 | 16.6 | 22.8 | 26.5 | 0.1 | 100.0 |

*A smaller number of observations were used to compute this measure due to incomplete LEP data.

The differences are starker for LEP students, whose classmates include even fewer blacks, more poor students, and more Asian students. Fully half of their classmates are Hispanic, and a quarter are LEP. The pattern differs somewhat across school levels. The difference between the exposure index for immigrants and the index for all students is narrowest for high schools and greatest for elementary schools. As an example, at the elementary school level, immigrants are exposed to significantly fewer blacks, while the differences at the high school level are insubstantial.

### Segregation of Immigrants and LEP Students

As shown in Table 2, a vast majority of all students and a majority of the recent immigrants attend schools that are less than 20 percent recent immigrant–only 59 schools have more than 20 percent immigrant students. There are, in fact, only four schools in our data base serving mostly immigrants, and three of them are high schools. Further, schools serving more immigrants also serve a greater proportion of LEP students, poor students, Hispanics, and Asians, but a smaller proportion of blacks.

The dissimilarity indices in Table 3 indicate that there is some segregation of immigrants. Roughly 32 percent of immigrant students would have to switch schools to create an even distribution across schools. This segregation is significantly milder, however, than the segregation indicated by the higher dissimilarity indices for blacks, Hispanics, Asians, and even the poor. Interestingly, the segregation of immigrants is lowest in elementary schools and highest in middle schools, even though in New York City, as elsewhere, the choice of elementary school is dictated largely by residential location. Since most students attend local elementary schools that serve students residing in a geographically defined zone, segregation in elementary schools likely reflects patterns of residential location. One might expect residential segregation to translate into school segregation. For middle and high schools, however, more choice is available, and more students attend secondary schools outside of their neighborhoods, including specialized programs such as the newcomer schools aimed specifically at immigrants. Thus, segregation also reflects the choices and preferences of students and schools. The increasing segregation of immigrants is in sharp contrast to the consistently declining segregation of blacks, Hispanics, Asians, poor students, and even LEP students.

### Demographics of Immigrants

Our analyses of the socioeconomic characteristics of immigrant students at the elementary and middle school levels yielded interesting results. Perhaps most interesting is that the overlap between recent immigrants and LEP students is only partial (roughly 64 percent of the recent immigrants in middle school are LEP, and only 52 percent in elementary school), which explains the divergence in their exposure indices noted above. The implication is that in forming policy a distinction needs to be made between recent immigrants and LEP students. In particular, any additional resources intended to assist immigrants that are targeted

*Table 2*
**Distribution of Students by Representation of Immigrants**

| *Percent Immigrants (Range)* | *Number of Schools* | *Number of Students* | *Number of Immigrant Students* | *Percent of Total Immigrants* | *Percent LEP* | *Percent Free Lunch Eligible* | *Percent Black* | *Percent Hispanic* |
|---|---|---|---|---|---|---|---|---|
| Below 5% | 481 | 344,982 | 9,439 | 10.3 | 8.6 | 70.3 | 46.1 | 33.8 |
| 5 to 10% | 299 | 291,231 | 21,275 | 23.1 | 15.8 | 71.3 | 36.1 | 40.7 |
| 10 to 15% | 185 | 217,725 | 26,388 | 28.7 | 21.9 | 72.6 | 27.9 | 43.8 |
| 15 to 20% | 78 | 104,540 | 17,915 | 19.5 | 25.7 | 71.3 | 17.2 | 38.3 |
| 20 to 30% | 46 | 53,864 | 12,282 | 13.3 | 33.0 | 75.3 | 13.6 | 35.8 |
| 30 to 40% | 8 | 8,984 | 3,141 | 3.4 | 35.6 | 86.4 | 26.0 | 23.7 |
| 40 to 50% | 1 | 644 | 287 | 0.3 | 45.7 | 83.0 | 21.1 | 15.7 |
| 50 to 60% | 1 | 302 | 175 | 0.2 | 85.0 | 71.3 | 13.6 | 36.8 |
| 60 to 70% | 1 | 305 | 206 | 0.2 | 94.8 | 93.7 | 12.8 | 36.1 |
| 70 to 80% | 0 | | | | | | | |
| 80 to 90% | 0 | | | | | | | |
| 90 to 100% | 2 | 975 | 930 | 1.0 | 89.8 | 84.8 | 4.7 | 53.1 |
| TOTAL | 1,102 | 1,023,552 | 92,038 | 100.0 | 45.6 | 78.0 | 21.9 | 35.8 |

*Table 3*
**Dissimilarity Indices**

| *Label* | *All Schools* | *Elementary Schools* | *Middle Schools* | *High Schools* |
|---|---|---|---|---|
| Immigrants | 0.3185 | 0.3090 | 0.3632 | 0.3404 |
| Female | 0.0644 | 0.0345 | 0.0411 | 0.1363 |
| Black | 0.5347 | 0.5925 | 0.5269 | 0.4335 |
| Hispanic | 0.4788 | 0.5053 | 0.4854 | 0.4273 |
| Asian | 0.5212 | 0.5583 | 0.5165 | 0.4532 |
| White | 0.6533 | 0.7025 | 0.6233 | 0.5817 |
| LEP | 0.3711 | 0.3721 | 0.3783 | 0.3596 |
| Free Lunch Eligible | 0.5234 | 0.4960 | 0.4213 | 0.4283 |

at LEP students may overlook as much as 42 percent of recent immigrants. Further, although the popular perception of immigrant students is of Hispanics and Asians challenged primarily by limited language skills, our analysis indicates that a significant portion of the recent immigrants is black and a good portion is white. Further, poverty among LEP students is significantly higher than among recent immigrants, which is modestly higher than for students overall.

### Resources and Performance: The Immigrant Experience

As shown in Table 4, on average, immigrant children attend schools with fewer resources (i.e., schools that spend roughly $7,582 per pupil, compared to the average $7,816). The spending disparity is highest in elementary schools (more than $285 per pupil), shrinking almost by half in middle and high schools. While the pupil-teacher ratio shows a similar pattern (fewer resources at the elementary level, similar resources elsewhere) the data indicate that the teachers of immigrant students are slightly better educated and have slightly more experience. Again, the pattern for LEP students is different–LEP students attend schools with typical or higher spending and smaller pupil-teacher ratios, but less experienced, less educated teachers in both elementary and middle schools. Both immigrants and LEP students attend larger schools. Whether this reflects the greater breadth of Bilingual/ESL programs available in larger schools or, alternatively, a preference for larger schools is unknown, but worth further study. Finally, while immigrants attend elementary schools with higher performance on reading and math tests and only slightly lower performance at middle school, LEP students attend schools with lower performance at both levels.

The regression analyses in Table 5 describe the relationship between resources and the socioeco-

*Table 4*
**Resources and Performance**

| *Label* | *N* | *Mean* | *Pupil Weighted Mean* | *Immigrant Weighted Mean* | *LEP Weighted Mean** | *Minimum* | *Maximum* |
|---|---|---|---|---|---|---|---|
| | | | *Elementary School* | | | | |
| Total School Register | 691 | 778.6 | 939.8 | 1,017.9 | 1,031.6 | 42.0 | 2,672.0 |
| Read 5th Grd: mean N.C.E. | 641 | 50.1 | 49.9 | 51.1 | 48.2 | 4.0 | 86.0 |
| Math 5th Grd: mean N.C.E. | 644 | 56.3 | 56.2 | 58.3 | 54.6 | 1.0 | 87.5 |
| Read 4th Grd:% 50+ pctile 97 | 660 | 53.8 | 53.2 | 55.4 | 49.7 | 11.3 | 100.0 |
| Math 4th Grd:% 50+ pctile 97 | 661 | 63.6 | 63.2 | 65.8 | 59.3 | 14.7 | 100.0 |
| Total Spending Per Pupil | 689 | 8,216.5 | 7,921.8 | 7,636.3 | 7,901.8 | 5,537.2 | 19,441.0 |
| Pupil Teacher Ratio | 689 | 16.0 | 16.4 | 16.7 | 16.1 | 6.6 | 31.5 |
| Teacher Experience % 5 year + | 669 | 61.4 | 61.5 | 62.2 | 60.4 | 6.7 | 92.9 |
| Teacher Education % Masters + | 669 | 78.8 | 78.8 | 80.7 | 77.8 | 41.7 | 100.0 |
| | | | *Middle School* | | | | |
| Total School Register | 233 | 847.9 | 1,168.9 | 1,285.5 | 1,236.9 | 59.0 | 2,250.0 |
| Read 8th Grade: mean N.C.E. | 224 | 50.5 | 50.9 | 50.4 | 48.7 | 24.0 | 81.8 |
| Math 8th Grade: mean N.C.E. | 224 | 52.7 | 53.8 | 53.2 | 51.4 | 31.2 | 84.6 |
| Read 7th Grade:% 50+ pctile 97 | 217 | 43.3 | 45.3 | 44.0 | 40.8 | 5.3 | 95.1 |
| Math 7th Grade:% 50+ pctile 97 | 218 | 49.4 | 51.5 | 49.7 | 45.9 | 6.9 | 100.0 |
| Total Spending Per Pupil | 231 | 8,701.1 | 8,095.2 | 7,931.5 | 8,242.5 | 4,761.5 | 22,414.4 |
| Pupil Teacher Ratio | 231 | 14.7 | 15.1 | 15.1 | 14.6 | 7.7 | 22.0 |
| Teacher Experience % 5 year + | 194 | 62.9 | 65.2 | 65.4 | 63.8 | 0.0 | 100.0 |
| Teacher Education % Masters + | 194 | 77.5 | 78.7 | 79.3 | 77.7 | 50.0 | 100.0 |
| | | | *High School* | | | | |
| Total School Register | 173 | 1,658.8 | 2,761.2 | 2,932.9 | 2,966.4 | 27.0 | 5,021.0 |
| Total Spending Per Pupil | 173 | 8,105.8 | 7,427.2 | 7,284.9 | 7,408.9 | 5,360.3 | 17,170.7 |
| Pupil Teacher Ratio | 173 | 17.0 | 18.4 | 18.3 | 18.0 | 7.1 | 21.9 |

*A smaller number of observations were used to compute this measure due to incomplete LEP data.

nomic characteristics of the students and indicate that, as suggested earlier, immigrant students get fewer resources, whether measured by expenditures or by pupil-teacher ratio. At the same time, their teachers are better educated. All of these coefficients are significant for elementary schools, but only the expenditure result, which is more than twice as large, is significant for middle schools. Once again, LEP students are treated differently–spending is (significantly) higher, class sizes are (significantly) smaller, but teachers are less educated ( significant only for elementary schools). Other coefficients are consistent with stated educational policies–spending increases and pupil-teacher ratio declines with the representation of special education and poor students–but teacher education declines with poverty and is increasing only in the representation of part-time (and not full-time) special education students.

Interestingly, race per se seems to play little direct role in resource allocation. Coefficients are generally insignificant determinants of expenditures or pupil-teacher ratio; however, teacher education decreases significantly with the percentage black at the elementary and middle school levels and with the percentage Hispanic at the elementary school level, even though limited English proficiency and poverty are included variables.

Finally, regressions were estimated that included variables describing the characteristics of the immigrant population (see Schwartz and Gershberg, 2000, for parameter estimates). Two important findings stand out. First, there is some evidence that the race of the immigrant population matters. In particular, even fewer resources (measured both by expenditures and pupil-teacher ratio) are allocated to schools in which a greater share of the immigrants is black. This provides some suggestive support for advocates for Caribbean immigrants, who claim that these students have needs, unaddressed by the school system, that derive from their immigrant status. Second, the regressions indicate that spending declines with the share of the immigrants who are LEP, revealing a divergence in the treat-

*Table 5*
**Resource Equity Regressions**

| | *Elementary Schools* | | | *Middle Schools* | | |
|---|---|---|---|---|---|---|
| | *Expenditure Per Pupil (1)* | *Pupil Teacher Ratio (2)* | *Teacher Education (3)* | *Expenditure Per Pupil (4)* | *Pupil Teacher Ratio (5)* | *Teacher Education (6)* |
| **Intercept** | **7,385.23** | **16.67** | **82.60** | **4,940.16** | **20.11** | **67.09** |
| | (868.66) | (1.48) | (8.30) | (1,355.73) | (1.77) | (10.90) |
| **Pct Female** | **–29.52** | **0.08** | 0.05 | 8.71 | 0.00 | **0.39** |
| | (17.27) | (0.03) | (0.17) | (26.51) | (0.03) | (0.22) |
| **Pct FT Special Ed.** | **171.91** | **–0.20** | –0.06 | **160.97** | **–0.19** | 0.08 |
| | (7.14) | (0.01) | (0.07) | (19.13) | (0.02) | (0.13) |
| **Pct PT Special Ed.** | **133.74** | **–0.16** | **0.67** | **131.33** | **–0.07** | **0.70** |
| | (16.69) | (0.03) | (0.16) | (29.93) | (0.04) | (0.21) |
| **Pct Free Lunch** | 1.17 | **–0.02** | **–0.09** | 9.79 | **–0.04** | **–0.10** |
| | (2.92) | (0.00) | (0.03) | (6.97) | (0.01) | (0.05) |
| **Pct LEP** | **22.65** | **–0.06** | **–0.16** | **50.08** | **–0.05** | –0.13 |
| | (5.12) | (0.01) | (0.05) | (18.19) | (0.02) | (0.13) |
| **Pct Black** | 3.78 | –0.01 | **–0.07** | 4.04 | 0.00 | **–0.12** |
| | (2.74) | (0.00) | (0.03) | (5.95) | (0.01) | (0.04) |
| **Pct Hispanic** | –1.22 | 0.01 | **–0.05** | –10.66 | 0.01 | –0.06 |
| | (3.14) | (0.01) | (0.03) | (7.77) | (0.01) | (0.05) |
| **Pct Asian** | 1.89 | **0.01** | **0.10** | 12.18 | 0.01 | 0.04 |
| | (3.53) | (0.01) | (0.03) | (9.67) | (0.01) | (0.07) |
| **Pct Immigrant** | **–28.63** | **0.05** | **0.38** | **–80.33** | 0.03 | 0.29 |
| | (8.85) | (0.02) | (0.08) | (26.65) | (0.03) | (0.18) |
| **R-square** | 0.64 | 0.59 | 0.40 | 0.50 | 0.60 | 0.41 |
| **N** | 670 | 670 | 664 | 208 | 208 | 189 |

*Note 1:* All regressions are weighted by number of students.
*Note 2:* Bold indicates significant at the 10% level or higher.
*Note 3:* Standard errors in parentheses.

ment of recent and non-recent immigrant LEP students–which includes second generation, non-recent immigrants and Puerto Rican students.

The regression analyses in Table 6 describe the relationship between school output (measured by performance on math and reading tests for fifth and eighth grade) and the characteristics of the students. In each case, independent variables include measures of test performance for the same school for the prior year and previous grade.[14] As in other studies, the regressions indicate that test performance declines with the representation of poor, LEP, black, and Hispanic children and, at the elementary school level, increase with percentage immigrants. (White is the omitted category.) This provides additional evidence of the need for policymakers to disentangle language and other immigrant issues. Note, however, that under some circumstances LEP students are exempt from the reading and math tests, so these results need to be interpreted with caution.[15]

In a fuller specification, Schwartz and Gershberg (2000) investigate the interaction between immigrant status and other student characteristics as well as the impact of different concentrations of immigrants. These analyses reveal that, at the elemen-

*Table 6*
**Output Equity**
**Dependent Variable - Average NCE**

| | *Reading Fifth Grade (1)* | *Math Fifth Grade (2)* | *Reading Eighth Grade (3)* | *Math Eighth Grade (4)* |
|---|---|---|---|---|
| **Intercept** | **34.20** | **35.65** | **31.72** | **38.69** |
| | (4.07) | (5.00) | (3.61) | (4.08) |
| **Lagged Test Score in Reading** | **0.33** | | **0.43** | |
| | (0.01) | | (0.02) | |
| **Lagged Test Score in Math** | | **0.38** | | **0.44** |
| | | (0.02) | | (0.02) |
| **Percent Female** | 0.12 | 0.10 | 0.01 | –0.02 |
| | (0.08) | (0.10) | (0.07) | (0.08) |
| **Percent Full Time Special Ed.** | –0.03 | –0.01 | –0.06 | –0.04 |
| | (0.03) | (0.04) | (0.05) | (0.05) |
| **Percent Part Time Special Ed.** | –0.08 | –0.08 | –0.01 | **–0.23** |
| | (0.08) | (0.09) | (0.08) | (0.09) |
| **Percent Free Lunch** | **–0.05** | **–0.05** | 0.03 | 0.00 |
| | (0.01) | (0.02) | (0.02) | (0.02) |
| **Percent LEP** | **–0.05** | **–0.05** | –0.01 | 0.06 |
| | (0.02) | (0.03) | (0.04) | (0.05) |
| **Percent Black** | **–0.04** | **–0.08** | –0.01 | **–0.05** |
| | (0.01) | (0.02) | (0.01) | (0.02) |
| **Percent Hispanic** | **–0.03** | **–0.05** | **–0.03** | **–0.07** |
| | (0.01) | (0.02) | (0.02) | (0.02) |
| **Percent Asian** | –0.01 | 0.02 | –0.02 | –0.04 |
| | (0.02) | (0.02) | (0.03) | (0.03) |
| **Percent Immigrant** | **0.12** | **0.12** | –0.03 | –0.06 |
| | (0.04) | (0.05) | (0.07) | (0.07) |
| **R-square** | 0.83 | 0.85 | 0.90 | 0.91 |
| **F** | 306 | 334 | 194 | 214 |
| **N** | 617 | 621 | 233 | 235 |

*Note 1:* All regressions are weighted by number of students.
*Note 2:* Bold indicates significant at the 10% level or higher.
*Note 3:* standard errors in parentheses.

tary school level, the positive relationship between performance and immigrants becomes significant only as the share of immigrants reaches 5 percent, and the magnitude of that effect then declines mildly with immigrant share. Second, at the elementary school level, performance increases with the percentage of the immigrants that is LEP, while the share of Hispanics becomes completely insignificant.

For middle schools, the results are rather different, with math scores being negatively associated with the proportion of immigrants, and the magnitude of that effect appearing to increase as the proportion increases. In addition, the scores for middle

school immigrants who are black are worse, all else equal, in both math and reading. This is particularly troubling given our previous finding that this group may receive fewer resources.

## CONCLUSION

The key findings in this paper follow. To begin, although recent immigrants represent less than 10 percent of New York City's public school students (and LEP students, about 17 percent), our analyses provide encouraging news about their distribution across schools. Public schools span the full range in their representation of immigrant or LEP students. Our results suggest, however, that immigrants are not more segregated than blacks, Hispanics, or poor students. Further, the segregation of immigrants is lowest in elementary schools and highest in middle schools, even though the choice of elementary school is dictated largely by residential location, while the choice of middle and high schools is more likely to reflect preferences of students and schools. Some of this segregation is undoubtedly programmatic. Newcomer schools, for example, educate only recent immigrants. Nevertheless, immigrants are exposed to a somewhat different set of classmates than the average New York City public school student–the classmates of the typical immigrant are less likely to be black, more likely to be Asian and LEP, and almost 15 percent will be recent immigrants themselves.

Equally important, despite the popular perception of immigrant students as Hispanic or Asian with limited English proficiency, a significant portion of recent immigrants is black, a good many are white, and a significant portion does not have limited English proficiency.

Further, our analyses indicate that the LEP and immigrant experiences diverge significantly. While school resources (measured by pupil-teacher ratio and spending) generally decline with the increasing numbers of immigrants, the opposite occurs with LEP students. Average education of teachers increases with the percentage of immigrants, but decreases with the percentage of LEP. Finally, our analyses of school outputs (measured by math and reading test scores) indicate that while a greater representation of immigrant students indicates higher or better output, a greater representation of LEP students indicates lower performance.

Finally, we find evidence that not all immigrant groups are treated equally–in particular, recent black immigrants, who are less likely to be LEP, seem to receive fewer resources and perform relatively poorly. Thus, while New York City and State have virtually no organized policies to support immigrant education aside from those aimed at English proficiency, it seems that the issues and experiences of LEP students and recent immigrants are different enough that they merit more refined policy responses.

### Notes

[1] See McDonnell and Hill (1993), Vernez and Abrahamse (1996), or Rivera-Batiz (1995) for an introduction.

[2] It is also possible that the additional resources may be diverted to benefit non-LEP students or programs Parrish (1994) suggests most of these are not, in fact, spent on supplementary direct instruction.

[3] Tanners (1997) also examines immigrants in New York City public schools.

[4] NYCBOE now uses the term 'English Language Learners' (ELLs) instead of LEP See Gershberg (2000) for more on the institutions governing the treatment of immigrants in New York City public schools.

[5] These data were generously provided by the Institute for Education and Social Policy at New York University. Thanks are due to Patrice Iatarola for her help in assembling and interpreting the data.

[6] On average, excluded schools are smaller, with slightly more blacks and Hispanics, slightly fewer poor and immigrant students.

[7] The NYCBOE provides an elementary, middle, or high school designation, which reflects a variety of considerations. We define instructional level based on the lowest and highest grades reported and tested.

[8] Notice that lagged values for the school may differ from the lagged performance of this years' fifth (or eighth) graders due to mobility or absenteeism, for example, that lead to different test-taking populations in the two years.

[9] In the variables created from the student-level data, Limited English Proficiency (coded LEP2 ) refers to students who are entitled to English as a Second Language services (whether or not they receive services).

[10] Expenditures are defined as the grand total of all school level spending (excluding pass-throughs), including direct services to schools, as well as allocations of district/superintendency and systemwide costs Direct services cover classroom instruction, instructional support services, school leadership, ancillary support services, building services, and district support. District and systemwide costs include instructional support, and administrative and other costs.

[11] The first term $(x_i/\Sigma x_i)$ represents the share of the total pool of immigrants in school $i$ and the second term





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$(y_i/t_i)$ represents the percentage of students of type $Y$ in school $i$. Thus, $E_{xy}$ is the weighted average of the percentage of student of type $Y$ across schools, where the weight is the share of the total number of immigrants in the schools.

[12] See Berne and Stiefel (1984) for more on the measurement of inter-district equity. See Iatarola and Stiefel (2000) for a discussion of intra-district equity and an application to New York City, and Schwartz (1999) for a discussion and application of the multivariate approach to investigating intra-district equity.

[13] Descriptive statistics by instructional level are available from the authors and in Schwartz and Gershberg (2000).

[14] The implication of including the prior test score is that the estimated parameters capture the differences in performance associated with the representation of different groups in the student body controlling for previous performance–thus, it might be interpreted as capturing differences in gains in performance between the two years.

[15] While detailed analyses are unavailable, however, many of the LEP students are not exempt and there is some evidence that a majority of LEP students do, in fact, take the reading test and a large majority take the math test.

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